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10/593,607	09/21/2006	Takeo Yajima	4724-0038WOUS	1929

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EXAMINER	
HILTON, ALBERT	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/593,607	YAJIMA, TAKEO	
	Examiner	Art Unit	
	Albert Hilton	1716	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 November 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *1-4 and 10-12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5-9 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 9, 5, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yajima (US Patent Application No. 20020131875) in view of Isogai (US Patent No. 6736900), Kawata (US Patent No. 4932353), and Butler (US Patent Applciation No. 20050139344).

1. Regarding claim 9, Yajima describes an apparatus in which a chemical liquid accommodated in a chemical liquid tank (**tank 3**) is dispensed from a nozzle (**nozzle 18**) of a nozzle body (Yajima: paragraph 47, Fig. 2), the apparatus comprising:

2. a pump (**pump 16**) having an elastically deformable and tube-shaped flexible film (**flexible tube 24**) forming a pump room, whose one end communicates with a primary-side chemical liquid flow path (**return path 19**) communicating with the

chemical liquid tank and whose other end communicates with a secondary-side chemical liquid flow path (**delivery path 17**) communicating with the nozzle body (**18**) (Yajima: paragraphs 52, 56-57, and Fig. 4), wherein when the flexible film (**24**) expands the volume of the pump room (**16**), the liquid in the liquid tank (**3**) is sucked into the pump room (**16**), and when the flexible film shrinks the volume of the pump room (**16**), the liquid in the pump room is dispensed to the nozzle body (**18**) (Yajima: paragraphs 57, 60-61, and Fig. 4);

3. an assembly (**body 1**), in which the pump (**16**), a primary-side valve (**valve V5**) for opening/closing the primary-side chemical flow path (**19**), and a secondary- side valve (**valve V4**) for opening/closing the secondary-side chemical flow path (**17**) are provided (Yajima: paragraphs 51-52 and Figs. 2, 4). Yajima does not describe an apparatus in which the nozzle body is incorporated into the same assembly that houses the pump and valves (Yajima: Fig. 2). However, Isogai teaches the use of an assembly (**dispenser unit 30**) that comprises both a pump (**screw pump 94**) and a nozzle body (**nozzle 90**) (Isogai: column 6, lines 50-55, column 11, lines 5-9 and Fig. 3). Isogai further teaches that the incorporation of the pump and nozzle in the same assembly improves fluid delivery by preventing flow resistance arising form a change in feeding direction (Isogai: column 3, lines 13-22). One of ordinary skill in the art at the time of the invention, motivated by a desire to reduce the flow resistance in the apparatus of Yajima would therefore have found it obvious to place the nozzle and pump into one assembly.

4. Further regarding claim 9, Yajima does not describe a double tube comprising an internal tube containing the primary-side chemical liquid flow path, and an external tube

in which the internal tube is disposed and in which temperature control water flows, as well as a return path for the temperature control water.

5. However, Kawata teaches that, in a chemical dispensing apparatus, it is desirable to provide an external tube (**heat exchanger 6**) with temperature-control water along the internal tube (**pipe 9**) of the chemical in order to keep the dispensed chemical at a desired viscosity (Kawata: column 3, lines 38-47, column 4, lines 12-28). Kawata teaches a double-tube configuration in which the temperature control water flows along the same flow direction as that of the chemical liquid, and a return path connected separately from the double tube (**6/9**) between the nozzle (**nozzle 18** of Yajima) and temperature controller (**15** of Kawata) (Kawata: Fig. 1).

6. One of ordinary skill in the art at the time of the invention, desiring to supply the chemical in the apparatus of Yajima with a controlled viscosity, would therefore have found it obvious to add an external tube to the apparatus of Yajima in view of Isogai.

7. The operation of the heat-exchanging external tube of Kawata requires that the external tube be placed in close proximity to the inner tube in order for heat transfer to occur. One of ordinary skill in the art would therefore have found it obvious to locate the external tube within the pump assembly such that the temperature-controlled water flow path is formed in the pump.

8. Further regarding claim 9, Yajima in view of Isogai and Kawata describes an external tube for temperature-controlled water surrounding an internal flow path for a dispensed chemical in a pump assembly, but does not describe a coupling block with a

branch that causes the temperature control water from the external tube to flow into the temperature control water flow path.

9. However, Butler teaches a coupling block (**T-adapter 6**) wherein a branching path causes one liquid (**cooling fluid 13**) from an external tube to couple with the flow path of a second liquid (**inlet 28**) to facilitate a heat exchange in an apparatus (**tank 22**) (Butler: paragraphs 12, 16, and Fig. 4). One of ordinary skill in the art at the time of the invention, desiring to couple the temperature-controlled water and the chemical flow path in the pump assembly of Yajima in view of Isogai and Kawata, would therefore have found it obvious to make use of the coupling block of Butler to join the two flow paths in the prior art apparatus.

10. Regarding claim 5, Yajima in view of Isogai, Kawata, and Butler teaches an apparatus wherein a flexible film (**24**) is expanded by decreasing the pressure of a driving medium (**pressure fluid**) and shrunk by increasing the pressure of the driving medium (Yajima: paragraph 62 and Fig. 8).

11. Regarding claim 13, Yajima describes an apparatus in which a chemical liquid accommodated in a chemical liquid tank (**tank 3**) is dispensed from a nozzle (**nozzle 18**) of a nozzle body (Yajima: paragraph 47, Fig. 2), the apparatus comprising:

12. a pump (**pump 16**) having an elastically deformable and tube-shaped flexible film (**flexible tube 24**) forming a pump room, whose one end communicates with a primary-side chemical liquid flow path (**return path 19**) communicating with the chemical liquid tank and whose other end communicates with a secondary-side chemical liquid flow path (**delivery path 17**) communicating with the nozzle body (**18**)

(Yajima: paragraphs 52, 56-57, and Fig. 4), wherein when the flexible film (**24**) expands the volume of the pump room (**16**), the liquid in the liquid tank (**3**) is sucked into the pump room (**16**), and when the flexible film shrinks the volume of the pump room (**16**), the liquid in the pump room is dispensed to the nozzle body (**18**) (Yajima: paragraphs 57, 60-61, and Fig. 4);

13. an assembly (**body 1**), in which the pump (**16**), a primary-side valve (**valve V5**) for opening/closing the primary-side chemical flow path (**19**), and a secondary- side valve (**valve V4**) for opening/closing the secondary-side chemical flow path (**17**) are provided (Yajima: paragraphs 51-52 and Figs. 2, 4). Yajima does not describe an apparatus in which the nozzle body is incorporated into the same assembly that houses the pump and valves (Yajima: Fig. 2). However, Isogai teaches the use of an assembly (**dispenser unit 30**) that comprises both a pump (**screw pump 94**) and a nozzle body (**nozzle 90**) (Isogai: column 6, lines 50-55, column 11, lines 5-9 and Fig. 3). Isogai further teaches that the incorporation of the pump and nozzle in the same assembly improves fluid delivery by preventing flow resistance arising form a change in feeding direction (Isogai: column 3, lines 13-22). One of ordinary skill in the art at the time of the invention, motivated by a desire to reduce the flow resistance in the apparatus of Yajima would therefore have found it obvious to place the nozzle and pump into one assembly.

14. Further regarding claim 13, Yajima does not describe a double tube comprising an internal tube containing the primary-side chemical liquid flow path, and an external tube in which the internal tube is disposed and in which temperature control water flows, as well as a return path for the temperature control water.

15. However, Kawata teaches that, in a chemical dispensing apparatus, it is desirable to provide an external tube (**heat exchanger 6**) with temperature-control water along the internal tube (**pipe 9**) of the chemical in order to keep the dispensed chemical at a desired viscosity (Kawata: column 3, lines 38-47, column 4, lines 12-28). Kawata teaches a double-tube configuration in which the temperature control water flows along the same flow direction as that of the chemical liquid, and a return path connected separately from the double tube (**6/9**) between the nozzle (**nozzle 18** of Yajima) and temperature controller (**15** of Kawata) (Kawata: Fig. 1).

16. One of ordinary skill in the art at the time of the invention, desiring to supply the chemical in the apparatus of Yajima with a controlled viscosity, would therefore have found it obvious to add an external tube to the apparatus of Yajima in view of Isogai.

17. The operation of the heat-exchanging external tube of Kawata requires that the external tube be placed in close proximity to the inner tube in order for heat transfer to occur. One of ordinary skill in the art would therefore have found it obvious to locate the external tube within the pump assembly such that the temperature-controlled water flow path is formed in the pump.

18. Further regarding claim 13, Yajima in view of Isogai and Kawata describes an external tube for temperature-controlled water surrounding an internal flow path for a dispensed chemical in a pump assembly, but does not describe a coupling block with a branch that causes the temperature control water from the external tube to flow into the temperature control water flow path.

19. However, Butler teaches a coupling block (**T-adapter 6**) wherein a branching path causes one liquid (**cooling fluid 13**) from an external tube to couple with the flow path of a second liquid (**inlet 28**) to facilitate a heat exchange in an apparatus (**tank 22**) (Butler: paragraphs 12, 16, and Fig. 4). One of ordinary skill in the art at the time of the invention, desiring to couple the temperature-controlled water and the chemical flow path in the pump assembly of Yajima in view of Isogai and Kawata, would therefore have found it obvious to make use of the coupling block of Butler to join the two flow paths in the prior art apparatus.

20. Further regarding claim 13, Yajima in view of Isogai, Kawata, and Butler teaches an apparatus wherein a flexible film (**24**) is expanded by decreasing the pressure of a driving medium (**pressure medium 27**) and shrunk by increasing the pressure of the driving medium (Yajima: paragraphs 57, 62 and Figs. 4 and 8).

21. Further regarding claim 13, the temperature control water that flows around an outer circumference of a driving room (**pressure chamber 26**) filled with the driving medium (**pressure medium 27**) (Yajima: paragraph 57, Fig. 4), causes temperatures of the chemical liquid and the driving medium to be kept constant (Kawata: column 1, lines 46-62).

Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yajima in view of Isogai, Kawata, and Butler as applied to claims 9 and 5 above, and further in view of Kawano (US Patent No. 6258167).

22. Regarding claim 6, Yajima in view of Isogai, Kawata, and Butler does not teach a movable arm connected to a nozzle assembly. However, Kawano discloses a chemical

supply apparatus having a nozzle assembly (**20**) attached to a movable arm (**movable member 34**) (Kawano, column 1, lines 48-50, and Kawano, Figures 4 and 6). Kawano teaches that using a movable arm to deposit material in a coating apparatus to coat the entire length of a substrate and to maintain a constant height above the substrate results in a coating film having uniform thickness. (Kawano, column 4, lines 37-45 and column 5, lines 1-10). One of ordinary skill in the art, motivated by a need to precisely control the thickness of a film deposited by the apparatus of the Yajima in view of Isogai, Kawata, and Butler, would have found it obvious to improve upon the apparatus of the combined references by placing the dispensing pump inside a movable arm.

23. Regarding claim 7, Yajima in view of Isogai, Kawata, and Butler teaches a driving device (**fluid supply source 40**) for increasing and decreasing the pressure of the driving medium (**pressure medium 27**) with which the driving room (**pressure chamber 26**) is filed (Yajima: paragraphs 57, 62 and Figs. 4 and 8). The driving device (**40**) and driving room (**chamber 39**) are connected to each other via a tube (**fluid channel 41**) through which the driving medium flows (Yajima: paragraph 62 and Figs. 7-8). The combined references show that the pressurization room (**39**) and driving device (**40**) are at separate locations (Yajima: Fig. 7), but do not explicitly teach that the driving device (**40**) is located at a position other than the arm. However, the location of the driving device (**40**), either on or off the movable arm, would not affect the operation of the apparatus in a patentably distinct way, and would therefore represent a rearrangement of parts that would have been prima facie obvious to one of ordinary skill in the art at the time of the invention (see MPEP 2144.04).

24. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yajima in view of Isogai, Kawata, Butler, and Kawano as applied to claims 6-7 above, and in further in view of Fedulov (Fedulov, A. I., Journal of Mining Science, 1979, vol 15, pp. 54-65).

25. 14. Regarding claim 8, Yajima in view of Isogai, Kawata, Butler, and Kawano teaches an apparatus in which the driving medium (**pressure fluid**) of the flexible film (**24**) is expanded by decreasing the volume of the medium in the driving room (**39**), and the flexible film (**24**) is shrunk by increasing the volume of the incompressible medium (Yajima: paragraph 62 and Fig. 8). The combined references do not specify that the medium is incompressible. However, it is well-known in the art that incompressible fluids transfer pressure quickly as compared to compressible media, as is taught by Fedulov (Fedulov, page 2, paragraph 1). One of ordinary skill in the art at the time of the invention, would therefore have found it prima facie obvious to choose an incompressible fluid as a driving medium, with the reasonable expectation that such a design choice would allow for quick pressure transfer from the driving device to the driving room.

Response to Arguments

Applicant's arguments filed 11/30/2010 have been fully considered but they are not persuasive.

26. Regarding claim 9, applicant argues that Isogai's teachings relate to a specific context of applying adhesive on a millimeter scale to a printed circuit board, and as such

are not within the relevant art of applying chemical liquids during semiconductor etching, which takes place on a nanometer scale.

27. The examiner disagrees, and maintains that such a change in scale would not alter the fundamental principles behind Isogai's teachings, and that noting in the teachings of Isogai or Yajima would indicate that the incorporation of the pump and nozzle in the same assembly would fail to improve flow resistance in a nanoscale system.

28. The examiner maintains that the integration of known components into a single assembly does not patentably distinguish the assembly over the separated components (see MPEP 2144.04: Making Integral).

29. Regarding the Expert Declaration submitted by the applicant, the examiner maintains that the Declaration specifically fails to present persuasive factual findings or convincing support to obviate the teaching of Isogai, which states that the incorporation of the pump and nozzle into the same assembly improves fluid delivery by preventing flow resistance arising form a change in feeding direction. Further, the Declaration does not persuasively negate the advantages of incorporating separate pump and nozzle components into an integrated assembly.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert Hilton whose telephone number is (571)-270-5519. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Albert Hilton/
Examiner, Art Unit 1716

/Parviz Hassanzadeh/
Supervisory Patent Examiner, Art Unit 1716